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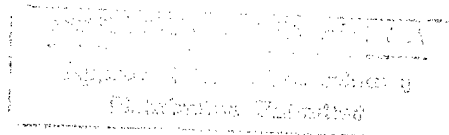
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USSR Report

CHEMISTRY

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24 MARCH 1987

USSR REPORT

CHEMISTRY

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ANALYTICAL CHEMISTRY

UDC 543.422.2:535.343.4

ASSAY OF WATER AND HYDROGEN CHLORIDE IN HIGHLY PURIFIED SILICON AND GERMANIUM CHLORIDES BY SUBMILLIMETER GAS SPECTROSCOPY

Moscow ZHURNAL ANALITICHESKOY KHIMII in Russian Vol 41, No 10, Oct 86
(manuscript received 22 Jul 85) pp 1812-1815

[Article by G.G. Devyatykh, B.A. Andreyev, V.P. Kazakov, A.F. Krupnov and V.A. Krylov, Institute of Chemistry, USSR Academy of Sciences, Gorky]

[Abstract] The utility of submillimeter gas radiospectroscopy in assay of the water and HCl concentration in highly purified samples of GeCl_4 and SiCl_4 was subjected to evaluation. The sensitivity of the method was enhanced by the use of a resonance cell and a more responsive electronic configuration in a spectrometer with an acoustic detector. The detection limit for water and HCl in GeCl_4 and SiCl_4 intended for fiber optics and semiconductors was 10^{-6} mole%. Residual water concentration of 3×10^{-7} mole% was the setting factor for the limit of detection. Figures 4; references 8: 7 Russian, 1 Western.

12172/9716
CSO: 1841/80

UDC 543.253

STRIPPING VOLTAMMETRY FOR ASSAY OF CHROMIUM IN MICROSAMPLES OF SINGLE CRYSTALS AND FILMS OF $\text{GaAs} \cdot \text{Cr}$

Moscow ZHURNAL ANALITICHESKOY KHIMII in Russian Vol 41, No 10, Oct 86
(manuscript received 22 Jul 85) pp 1847-1850

[Article by V.Ye. Sarayeva and A.A. Kaplin, Tomsk Polytechnic Institute imeni S.M. Kirov]

[Abstract] A method has been devised for the assay of chromium in microsamples of $\text{GaAs} \cdot \text{Cr}$ single crystals and films, using a two-cell polarograph. The essential approach consists of the electrochemical concentration of Cr(VI) on the graphite electrode and electrooxidation of the precipitate. Cr(III), obtained by solubilization of $\text{GaAs} \cdot \text{Cr}$ with acidic solutions, is oxidized to Cr(VI) with hydrogen peroxide for its electrochemical concentration. Analysis of the anodal voltampere plots demonstrated a linear relationship between the

increase in the anodal signal and Cr(VI) concentration in the $n \times 10^{-8}$ to $n \times 10^{-5}$ M range. The results obtained in recovery studies were in excellent agreement with the results obtained by spectrophotometric and atomic-absorption methods. Figures 2; references 5 (Russian).

12172/9716
CSO: 1841/80

UDC 542.61:543.3:546.712:547.29

ATOMIC ABSORPTION ANALYSIS OF MANGANESE IN WATER EXTRACTS

Moscow ZHURNAL ANALITICHESKOY KHIMII in Russian Vol 41, No 10, Oct 86
(manuscript received 30 Jul 85) pp 1858-1861

[Article by G.M. Kuchuk and A.K. Charykov, Leningrad State University imeni A.A. Zhdanov]

[Abstract] An atomic absorption method based on extraction with caprylic acid has been devised for the analysis of Mn in sea, river and precipitation water. A sample is filtered through a No 2 filter (0.45 μ m pore diameter), boiled with concentrated Hcl for decomposition of organic matter, and extracted with caprylic acid. Standard curves covering a range of 0.1 to 20 μ g/liter are constructed, with the analytical system showing a sensitivity down to 0.07 μ g/liter with extrapolation in the case of some samples. Figures 2; references 15: 14 Russian, 1 Western.

12172/9716
CSO: 1841/80

UDC 546.791:543.42

LASER-LUMINESCENT DETERMINATION OF URANIUM IN NATURAL WATERS BY CONCENTRATION ON TITANIUM HYDROXIDE AND BY USING SODIUM POLYSILICATE

Leningrad RADIOKHIMIYA in Russian Vol 28, No 5, Sep-Oct 86 (manuscript received 23 Jan 85, and, in final form, 27 Jun 86) pp 606-610

[Article by S. A. Nikitina and A.V. Stepanov]

[Abstract] Two methods were compared for determining uranium in samples containing large amounts of ion dampers in water samples from Vuoksa River, Baltic Sea and Bay of Finland. The first method consists of concentrating uranium with $TiO_2 \cdot nH_2O$ in dynamic conditions with subsequent laser-luminescent determination at 77 K in 0.1 mol/l H_2SO_4 . Experiments were made in static conditions to determine optimum concentration conditions. A known volume of ocean sample with total uranium concentration of 0.0069 μ g/ml ($2.92 \cdot 10^{-5}$ mol/l) was stirred with a determined amount of adsorbent for several minutes to 2 hours. Equilibrium was attained in 30 minutes for the prepared $TiO_2 \cdot nH_2O$ samples used in dynamic conditions. Samples of waters from the North-West Atlantic Ocean with total uranium of 2.38 μ g/ml were

studied under dynamic conditions with desorption using 0.1 and 1 mol/l H_2SO_4 . The maximum and minimum on the spectrum of luminescence of uranyl were 515 and 501 nm. This method was used also for four Bay of Finland water samples with uranium concentration $(0.40 \pm 0.04) \cdot 10^{-3}$ $\mu g/ml$. Time for analysis was about five hours. In the second method for uranium determination in ocean waters, a polysilicate solution of composition $Na_2O \cdot 3SiO_2$, which was prepared from SiO_2 and NaOH, was used. This method consists of direct registration of luminescence of uranium in 0.7% (also 0.1%) solution of sodium polysilicate at room temperature. The limit of detection for the second method is estimated as $2 \cdot 10^{-11}$ g/ml and for the first method it is lower because of concentration. The polysilicate method is particularly suitable for analysis of natural waters with a large concentration of hydrolyzing elements. Extinction rate constants of luminescence of uranyl for a large number of ion dampers in the polysilicate solution were determined. Analysis of ten samples from the North-West Atlantic had an average of $(3.14 \pm 0.30) \cdot 10^{-3}$ $\mu g/ml$ at $S_p = 13\%$ for the polysilicate method, and $(3.07 \pm 0.59) \cdot 10^{-3}$ $\mu g/ml$ for samples by the concentration method. Uranium of Vuoksa River, Finnish Bay, and Baltic Sea samples was 0.12, 0.38-0.41, and 1.11 $\mu g/l$, respectively, at wavelength 480-580 nm. Both methods are suitable for determining uranium in waters of external environments. However, the direct polysilicate method has decided advantages, which include greater simplicity and less time (20 minutes), in comparison with methods based on concentration on solid adsorbents and having a lower limit of detection. At the present time, this is the most promising method for determining uranium in natural waters with uranium of 10^{-10} g/ml. Figures 3; references 13: 7 Russian, 6 Western.

12886/9716

CSO: 1841/85

UDC 546.110.23:577.15/17

PREPARATION OF HIGHLY TRITIATED PROSTAGLANDINS A_2 , B_2 , $F_{2\alpha}$ AND $F_{2\beta}$

Leningrad RADIOKHIMIYA in Russian Vol 28, No 5, Sep-Oct 86 (manuscript received 23 Jul 1984) pp 603-606

[Article by V.P. Shevchenko, T. Yu. Lazurkina and N.F. Myasoyedov]

[Abstract] Biosynthesis of highly tritiated prostaglandin $F_{2\alpha}$ and chemical conversion of [3H] prostaglandin E_2 into [3H] prostaglandins A_2 , B_2 , $F_{2\alpha}$ and $F_{2\beta}$ are reported. Prostaglandin $F_{2\alpha}$ with 6.1 TBq/mmol radioactivity was obtained from [5,6,8,9,11,12,14,15- 3H] arachidonic acid by means of prostaglandin-synthesis of sheep semen. In this biosynthesis, [3H] prostaglandin E_2 (5.2 TBq/mmol) and prostaglandin D_2 are formed. Yields from the biosynthesis of prostaglandins E_2 , $F_{2\alpha}$ and D_2 are given without $SnCl_2$ and with ratios of .3, .5, 1, 3, 5, 10 $SnCl_2$ to 1 arachidonic acid. Highest yield of 34-35% [3H] prostaglandin $F_{2\alpha}$ was obtained at $SnCl_2/AA$ of 3:1 to 5:1 and then decreased with an increase of $SnCl_2$. [3H] prostaglandins A_2 , B_2 , $F_{2\alpha}$ and $F_{2\beta}$ with molar radioactivity of 4.4, 3.9, 5.5 and 5.5 TBq/mmol, respectively, and yields of 50, 85, 58 and 40% were obtained from [3H] prostaglandin E_2 by chemical conversion using alkaline and acid isomerization for B_2 and A_2 , respectively, and $NaBH_4$ for $F_{2\alpha}$ and $F_{2\beta}$. Radiopurity of all prostaglandins after purification was not less than 95-97%. Prostaglandins were stored in 7:3 aqueous-methanol solution at $-10^\circ C$. Figures 5; references 11: 6 Russian, 5 Western.

12886/9716
CSO: 1841/85

CATALYSIS

UDC 66.011

OPTIMUM PERIODIC TEMPERATURE CONTROL AT INLET OF ADIABATIC BED OF CATALYST

Moscow TEORETICHESKIYE OSNOVY KHIMICHESKOY TEKHNologii in Russian Vol 20,
No 5, Sep-Oct 86 (manuscript received 11 Dec 83) pp 626-632

[Article by A.M. Akhmetzyanov, V.A. Kuzin, deceased, Yu. Sh. Matros and
A.S. Noskov, USSR Academy of Sciences, Computer Center, Siberian Department,
Institute of Catalysis, USSR Academy of Sciences, Siberian Department]

[Abstract] Development of a numerical search algorithm for optimum control
of a non-stationary process in the course of a single reversible exothermic
reaction is presented and discussed. Operation of the algorithm during input
temperature control for a model reaction during ammonia synthesis is described.
Optimal control involves a step function with two steps of reversal in a
period. Figures 3; references 12: 7 Russian, 5 Western.

2791/9716
CSO: 1841/14

CHEMICAL INDUSTRY

PROFIT AND LOSS OPERATION FOR CHEMICAL AND PETROLEUM MACHINE BUILDING

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 28 Sep 86 p 2

[Article by V. Lukyanenko, the Minister of Chemical and Petroleum Machine Building: "The Whole Branch on a Profit and Loss Basis"]

[Text] Within three months all the associations and enterprises of the chemical and petroleum machine building industry are going to be changed over to a complete profit and loss method of accounting based on self-financing. What does this mean for our branch and how ready are we for this change over?

First of all I want to note that the 12th Five-year Plan [FYP] and the Further Prospects both contain intended rates of growth in the volumes of our production and for updating the types of articles we produce. This is something that our branch did not have in any of the preceding FYP's.

We see two interactions between the directions which we have to take to attain such sharp intensification of the branch's development. On one hand, this is the need to strengthen the action of centralized management of economic strategy, and on the other hand, to increase the role and independence of the associations and enterprises, and to raise their interest and responsibility for achieving these very high final results.

The changeover of the branch to a complete profit and loss basis also opens broad possibilities for successful realization of these directions. The experience of the Sumskiy NPO imeni Frunze [Scientific Production Association imeni Frunze] and the "AvtoVAZ" [Production Association of Volsk Automobile Plants for Passenger Cars] clearly shows that there is great potential for this method of management.

The interaction of profit and loss financing is strengthened, on one hand, by accelerating technical progress, and by the growth in effectiveness of production, on the other. This is understandable. The importance of profits is significantly increased, and this becomes the basic source for obtaining financial resources for the enterprises. The role of the allocations for development of production, science, and equipment and the allocation for social and communal use measures and housing construction is enhanced, since the size of these depends on the final results of the enterprise's work.

Added to this, as we know, is the right of the work collectives to independently allocate these funds.

Under such conditions the collective is vitally interested in the growth of production, increasing the technical level and quality of the product, decreasing waste and increasing labor productivity, and in the economics of material and labor resources. But all these factors are directly connected with profits, and it has started to be connected with payment of salaries and improvements in the daily life conditions of each member of the collective.

We understand quite well that the changeover to the new methods of management demands serious preparatory work. This is in progress within the branch in several directions. One of these, and we think it is the most important one, is restructuring management, strengthening the bonds between science and production, and creating of powerful scientific-production and production associations which have powerful material, labor, and financial resources, and a solid scientific and technical potential.

Setting up such associations allows us to span the unavoidable gulf between science and production, which is determined by the separate confirmation of planning tasks to the enterprises for producing products and branch scientific and design organizations for developing new equipment. Within the framework of the large associations which have extensive rights in the planning area, there is also a real capability to set up cooperation between the enterprises which comprise these associations in all matters of equipment and economics. In other words, there is a broad front for maneuver, the target of which is to liquidate the lack of profit of individual types of production, and to increase income from production. And that means to increase profits.

Considering that within the branch there are several medium and small enterprises which manufacture the most varied types of equipment, we are forming the associations both on the principle of unity of production and also on a territorial basis. Now we have created several associations with an annual volume of goods output of up to 400 million rubles each. These are the All-Union NPO "Kriotekhnika", the Ukrainian NPO for Chemical Machine Building, the NPO's "Uralkhimmash" and "Penzkhimmash", the PO "Bummash" in Ustinov, and others. This year they will number more than 20. They all will be directly subordinate to the ministry and the majority of [the branch's] scientific organizations will be part of their makeup. Calculations show that these associations will yield about 70 percent of the goods output for the branch. Thus there will be a durable basis for the change over to the two-link system of management with a ministry-association scheme.

What difficulties have we encountered in getting ready to work under self-financing conditions? The most significant of them is connected with the fact that in the branch there are already profitless and low-income enterprises, and also plants which are technically lagging and with severely worn out basic equipment. There is one solution here, and that is rapid completion of reconstruction and technical reequipping of such enterprises. But all this takes time. This is why at the beginning we will need part of the income and amortization which is obtained by other enterprises, and use it to support the

weak plants. We will allocate this in decreasing steps throughout the years of the FYP.

Another direction on which attention has been concentrated during the period of restructuring of the management mechanism is that of prospective matters concerning the branch's work, primarily in the areas of science and technology. This is organized in this way. More than 30 branch programs have been developed encompassing all basic aspects of activity, and we have confirmed a complex program of scientific and technical progress and social and economic development of chemical and petroleum machine building for the 12th FYP. Besides the fact that in this complex program are included tasks for creation and adoption of the production of new equipment, also in it are set out and agreed to by our customers measures to increase the technical level of our products. We have also determined the paths which will provide for accomplishing these tasks. We want to pay special attention to one of these, that of increasing the amount of resources available to the workers of the branch's science.

The branch's production base will have to undergo fundamental changes. In this FYP we intend to expend more than half of all the capital outlays available to us for technical reequipping and reconstruction of our enterprises. This doubles what was done during the preceding FYP. Some 10-12 percent of our active basic production will be updated each year. In the shops of our enterprises we intend to adopt flexible production systems, automated and robotized equipment, rotary and rotary-conveyer lines, and other modern equipment.

Thus we will create all the organizational and technical prerequisites for the branch's transformation to a complete profit and loss basis.

I want to emphasize that experience gained by the enterprises now working under self-financing conditions shows that the new management methods will facilitate more successful solution of social development matters for the collectives. And this leads to a decrease in instability in the work force, a strengthening of work discipline, and in its final stage, to growth in labor productivity and an increase in quality. What will be done for our branch's work force during this FYP? The complex program anticipates significant housing construction. Approximately 28,000 families will get new apartments. By the end of the FYP we will have completely resolved the problem with child care facilities and pre-schools. We will build dining facilities, polyclinics, sanatoria, dispensaries, and other social services projects. We will also build many more of them than we did before. We are also preparing to significantly improve the everyday services for the branch's work force, and to improve the output of foodstuffs and subsidiary services available to them.

The results of both the preparatory work and actually effecting the change over of the branch to a complete profit and loss basis depends primarily on how well people work, and first among these, the management staff of the associations and enterprises. And this means that it is necessary for the managers of all ranks to properly adopt the new management mechanism. More than 1,300 persons -- chiefs of economic and financial services and capital

construction -- have already received training at a branch institute to increase their qualifications, and where they have studied in detail the experience of the Sumskiy NPO imeni Frunze and that of "AvtoVAZ." Training is now in progress on the rules and methods with which each worker in the branch must be acquainted.

We must recognize that far from all the managers are ready to work in these new conditions. And this is, clearly, not a lack of the required knowledge. We will proceed from the basis that at the heads of enterprises and organizations there have to be people who are able to exercise initiative and executive ability, efficiency and creativity, and who can constantly tend to not only the development of production but also the improving of the work and everyday life of people. And we will have to replace those who are not able to measure up. In their place we will place young, promising workers.

Work done in the branch makes us confident that the new system of organization and production management based on economic levers will be able to provide for that acceleration which it demanded from us in the party decisions.

9016

CSO: 1841/2

EXPERTISE AND EXPERIENCE IN INDUSTRY

Moscow KHIMICHESKOYE I NEFTYANOYE MASHINOSTROYENIYE in Russian No 9, Sep 86
pp 1-3

[Abstract] The resolutions of the 27th Party Congress call for innovations and efficiency in the industrial sector, as well as implementation of progressive work methods. Through such efforts many Soviet workers in the chemical and oil machine construction industry have earned the title of Hero of Socialist Labor, and have set an example for others to emulate. Initiative, innovation, discipline, and socialist spirit of competitiveness form the cornerstone of success in meeting and exceeding the party program for Soviet economic development. The first year of the 12th Five-Year Plan has already shown much progress and it is to be expected that the entire program approved by the June 1986 Plenum of the CC of the CPSU, as enunciated by Comrade M.S. Gorbachev, shall be fulfilled.

12172/9716
COS: 1841/83

UDC 658.512/.513:66.05

IMPROVEMENTS IN PREPARATORY TECHNICAL SYSTEMS AND METHODS FOR PRODUCTION OF CHEMICAL EQUIPMENT

Moscow KHIMICHESKOYE I NEFTYANOYE MASHINOSTROYENIYE in Russian No 9, Sep 86
pp 42-44

[Article by Yu.P. Salatov, chief engineer, Dzerzhinsk Chemical Machine Construction Plant, and V.A. Taran, engineer]

[Abstract] A computer-based method has been devised at the Dzerzhinsk plant to meet the need for rapid reorientation in the manufacturing of specialty machinery for the chemical industry. In combination with new technical standards documentation, as well as introduction of new machinery and equipment, the productivity at the Dzerzhinsk plant has increased two- to six-fold. In addition, the quality indicators of the production have improved by 15%, and more than 90% of the production now is classified as being of State Quality.

12172/9716
CSO: 1841/83

POLYMER MEMBRANE SEPARATION OF GAS MIXTURES

Moscow TEORETICHESKIYE OSNOVY KHIMICHESKOY TEKHNologii in Russian Vol 20,
No 5, Sep-Oct 86 (manuscript received 30 Jul 84) pp 600-606

[Article by V.K. Yezhov and S.V. Kushnarev]

[Abstract] Material obtained in a survey of the literature is used to discuss processes of separation of gases with the use of polymer membranes. Some processes involving the use of separation with the aid of membranes are listed and discussed briefly. Approaches aimed at improvement of membrane characteristics and involving optimization of thermodynamic parameters affecting permeability and selectivity of a membrane are reviewed. Various means of designing the membrane stage of separation of gases are diagrammed, described and discussed. The advantages and disadvantages of each procedure are noted briefly. Figures 4; references 96: 53 Russian, 43 Western.

2791/9716

CSO: 1841/14

COAL GASIFICATION

UDC 662.75.(088.8)

INITIAL RATE OF COAL HYDROGENATION

Moscow KHIMIYA TVERDOGO TOPLIVA in Russian No 5, Sep-Oct 86 (manuscript received 26 May 86) pp 49-53

[Article by V.V. Chenets, N.I. Smirnov, V.N. Krotova and I.V. Kalechits, Institute of Petro- and Carbon Chemical Synthesis, IGU (Irkutsk State University) imeni A.A. Zhdanov; Institute of High Temperatures, USSR Academy of Sciences]

[Abstract] A variety of parameters (temperature, pressure, catalyst, solvent) were monitored for their effects on the initial rate of coal liquefaction. Although the underlying kinetic plots of the process were not affected by the type of catalyst or temperature, consisting of an initial rapid portion on the plot replaced by a slower portion, the rate was enhanced by catalysts and elevated temperatures. With the various coals tested, variations of pressure from 8.4 to 29.5 MPa had no effect on the velocity of the process. Liquefaction was most affected by the solvent employed, in terms of conversion during the first 30 min of hydrogenation. Solvents resulting in 60-80% conversion in the first 30 min included such compounds as tetrahydronaphthalene, whereas those yielding a conversion rate of 25-30% in that time frame were solvent systems such as phenol-free light tar oil or fraction 220-240°C from cycle I coal hydrogenation. Figures 3; references 7: 3 Russian, 4 Western.

12172/9716

CSO: 1841/86

CHARACTERISTICS OF COAL TAR OBTAINED BY GASIFICATION OF LVOV-VOLYN BASIN
SAPROPELITE COAL

Moscow KHIMIYA TVERDOGO TOPLIVA in Russian No 5, Sep-Oct 86 (manuscript
received 3 Apr 86) pp 63-68

[Article by D.V. Bryk, V.A. Gavenko, O.P. Ivanchishin, R.G. Makitra, M.Ye.
Petricovskaya, Yu.V. Stefanik and V.Yu. Tarasyuk, Institute of Geology and
Geochemistry of Combustible Minerals, UkSSR Academy of Sciences]

[Abstract] Chemical and spectral studies were conducted on coal tar obtained
by gasification at 1000-1100 °C of sapropelite coal from the Lvov-Volyn basin.
The coal tar consisted of a viscous dark-brown liquid with a sharp phenol
odor, containing up to 40% water. Data on distillation products are summarized
in tabular form, with the various fractions also subjected to UV and IR
spectroscopies. The coal tar, obtained by the water/air blast method, was,
on the whole, aromatic in nature and quite similar to the tar obtained by
coking humus-type coals. In distinction to the latter, however, the coal tar
under study was characterized by a higher content of oxygen-containing com-
pounds, and a lower content of sulfur and nitrogen compounds. Figures 2;
tables 4; references 7: 6 Russian, 1 Czech.

12172/9716
CSO: 1841/86

UDC 621.315.592.2:546.28

GROWTH OF EPITAXIAL LAYERS OF SILICON IN VERTICAL REACTORS

Moscow TEORETICHESKIYE OSNOVY KHIMICHESKOY TEKHNologii in Russian Vol 20,
No 5, Sep-Oct 86 (manuscript received 5 Jan 82) pp 698-701

[Article by Ye.P. Prokopyev]

[Abstract] A mathematical description of epitaxial silicon growth in vertical reactors is presented and discussed. Calculations of mass transfer of reagents to and from the reactor base proceed from approximation of a stationary boundary layer. A diagram of a vertical-type, epitaxial reactor model most frequently used for calculation of growth of epitaxial layers is described. Figure 1; references 3 (Russian).

2791/9716
CSO: 1841/14

ORGANOPHOSPHORUS COMPOUNDS

UDC 547.26.'118

SYNTHESIS OF PROPERTIES OF BISDITHIOPHOSPHONIC ACIDS

Leningrad ZHURNAL OBSHCHEY KHIMII in Russian Vol 56, No 6, Jun 86 (manuscript received 12 Jul 85) pp 1227-1233

[Article by G.A. Kuttyrev, O.S. Korolev, N.R. Safiullina, E.G. Yarkova, O.Ye. Lebedeva, R.A. Cherkasov and A.N. Pudovik, Kazan State University imeni V.I. Ulyanov-Lenin]

[Abstract] Phosphorus dithioacids react readily with unsaturated compounds making it possible to synthesize functionally-substituted organophosphorus compounds, many of which have pronounced biological and other useful properties. However, data on the reactivity of dithioacids having two dithiophosphoryl groups is lacking, and methods for preparing them have not been developed. In the present work, bisdithiophosphonic acids were prepared by reaction of methylthiophosphonic perthio acid chloride with various glycols, and the conformational composition of the acids and their auto-association characteristics were studied. Cyclic structures having intermolecular hydrogen bonds were detected and the ability of bisdithiophosphonic acids to react by addition with unsaturated compounds having both electron donor and acceptor substituents to form 1:2 adducts was demonstrated. References 8: 4 Russian, 4 Western.

12765/9716
CSO: 1841/599

UDC 547.26'118

REACTIONS OF BISTHIOPHOSPHONIC ACIDS WITH NITRILES

Leningrad ZHURNAL OBSHCHEY KHIMII in Russian Vol 56, No 6, Jun 86 (manuscript received 22 Jul 85) pp 1233-1236

[Article by G.A. Kuttyrev, O.S. Korolev, E.G. Yarkova, R.A. Cherkasov and A.N. Pudovik, Kazan State University imeni V.I. Ulyanov-Lenin]

[Abstract] The reaction of dithioacids with nitriles is one of the most convenient methods for preparing thioamides and trithiopyrophosphates. Detailed study of the mechanism of these processes has made it possible to hypothesize

that the dithioacids react by addition at the nitrile bond in the first stage. The intermediate imidoaldithiophosphate is unstable and either rapidly isomerizes into amidothiophosphate or else decomposes with a second molecule of the dithioacid. In the present work, a study was made of the reaction of 1,5-dioxapentane- and 1,6-dioxahexanebismethylthiophosphonic acids. The reaction proceeds readily without any catalyst to form an intermediate 1:1 adduct which decomposes into thioamides and cyclic trithiopyrophosphonates. The stability of the latter is a function of the length of the hydrocarbon chain in the initial thiophosphorus reagent. Figures 1; references 8: 5 Russian, 3 Western.

12765/9716
CSO: 1841/599

UDC 547.26'118

REACTIONS OF N-PHOSPHORYLATED THIOAMIDES WITH DERIVATIVES OF MONO-CHLOROACETIC ACID

Leningrad ZHURNAL OBSHCHEY KHIMII in Russian Vol 56, No 6, Jun 86 (manuscript received 15 Jul 85) pp 1237-1242

[Article by N.G. Zabiroy, R.A. Cherkasov and A.N. Pudovik, Kazan State University imeni V.I. Ulyanov-Lenin]

[Abstract] A study was made of the reactions of N-phosphorylated carboxylic acid thioamides having a tetra-coordinated phosphorus atom with monochloroacetic acid, monochloroacetonitrile and methyl monochloroacetate. The reaction with monochloroacetic acid results only in products of S-alkylation at the sulfur atom of the C=S group. Products of S-alkylation do not isomerize into N- or X-alkylation products at the sulfur or oxygen atoms with the P=X group. By studying the reaction of tetraphenylimidodithiodiphosphate with derivatives of monochloroacetic acid as an example, it was established that the replacing of a C=S group with a P=S group results in the formation of S-alkylation products at the sulfur atom of the P=S group. A mechanism for the reaction is proposed. References 5: 3 Russian, 2 Western.

12765/9716
CSO: 1841/599

UDC 547.26'118

REACTIONS OF DIALKYLISOCYANATOPHOSPHITES WITH TRIFLUOROACETOACETIC ESTER

Leningrad ZHURNAL OBSHCHEY KHIMII in Russian Vol 56, No 6, Jun 86 (manuscript received 22 Jul 85) pp 1242-1244

[Article by I.V. Konovalova, L.A. Burnayeva, E.G. Yarkova, N.M. Kashtanova and A.N. Pudovik, Kazan State University imeni V.I. Ulyanov-Lenin]

[Abstract] A study was made of the reactions of dimethyl-, diethyl- and bis(1,1,3-trihydroperfluoropropyl)isocyanatophosphites with

trifluoroacetoacetic ester (which was found to be more reactive than acetoacetic ester). The first two reagents formed substituted 1,4,3-oxazaphospholanes, while the bis(1,1,3-trihydroperfluoropropyl)-isocyanatophosphite formed a dimer containing a diazaphosphetidene ring having a penta-coordinated phosphorus atom. References 3 (Russian).

12765/9716

CSO: 1841/599

UDC 547.27'118

REACTIONS OF BIS(1,1,3-TRIHYDROPERFLUOROPROPYL)PHOSPHOROUS ACID DERIVATIVES WITH CARBONYL COMPOUNDS

Leningrad ZHURNAL OBSHCHEY KHIMII in Russian Vol 56, No 6, Jun 86 (manuscript received 22 Jul 85) pp 1245-1249

[Article by I.V. Konovalova, L.A. Burnayeva, E.K. Khusnutdinova and A.N. Pudovik, Kazan State University imeni V.I. Ulyanov-Lenin]

[Abstract] It was previously shown that bis(1,1,3-trihydroperfluoropropyl)isocyanatophosphite reacts with ethylidenecyanoacetic ester to form substituted azaphospholenes having a P=N bond in the ring, while the same phosphite reacts with chloral and benzoylformic acid nitrile to form dimeric azaphospholenes. In the present work it was shown that bis(1,1,3-trihydroperfluoropropyl)isocyanatophosphite also reacts with benzyl and ethyl esters of benzoylformic acid to form substituted 1,3,2-oxazaphosphol-2-enes. This phosphite and N-(phenylalkoxymethylene) amidoyl-(1,1,3-trihydroperfluoropropyl)-phosphite also react with halogenocarbonyl compounds to form products of Perkov's reaction. References 6 (Russian).

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UDC 547.341

ACETYLENE-ALLENE REARRANGEMENT DURING ARBUZOV REACTION WITH DIALKYL ESTERS OF PHENYLPHOSPHONOUS ACID WITH PROPARGYL BROMIDE

Leningrad ZHURNAL OBSHCHEY KHIMII in Russian Vol 56, No 6, Jun 86 (manuscript received 19 Jul 85) pp 1249-1254

[Article by S.A. Abdulganeyeva, K.B. Yerzhanov and T.S. Sadykov, Institute of Chemical Sciences, KaSSR Academy of Sciences, Alma-Ata]

[Abstract] When propargyl bromide reacts with a dialkyl ester of phenylphosphonous acid, acetylene-allene-acetylene isomerization takes place. The degree of isomerization is a function of the reaction temperature and duration as well as the substrate structure. Thus, at room temperature and on silical gel, middle esters isomerize totally into acid esters of phenylphosphonous acid, while hydration of a mixture of phenylpropyl-2-enylphosphonic and phenyl-propyl-1,2-dienylphosphonic acids, under the conditions of

Kucherov's reaction, results in the formation of esters of phenylpropan-2-onylphosphinic acid. References 3: 2 Russian, 1 Western.

12765/9716
CSO: 1841/599

UDC 547.241 + 547.26'118

PHOSPHORYLATION OF N-SUBSTITUTED CARBOXYLIC ACID AMIDES WITH CHLOROPHOSPHITES

Leningrad ZHURNAL OBSHCHEY KHIMII in Russian Vol 56, No 6, Jun 86 (manuscript received 25 Jun 85) pp 1262-1268

[Article by A.D. Sinitsa, D.M. Malenko, L.A. Repina, R.A. Loktionova and A.K. Shurubura, Institute of Organic Chemistry, UkSSR Academy of Sciences, Kiev]

[Abstract] While the N-phosphorylated (P^{IV}) derivatives of carbonylic acid amides have been well studied and include many compounds of theoretical and practical interest, only *scarce* references exist for the corresponding P^{III} derivatives. In the present work a study was made of the reactions of acid chlorides of trivalent phosphorus with various N-substituted carboxylic acid amides in the presence of nitride bases. Phosphorylation of N-substituted acid amides with dialkylchlorophosphites results in both O- and N-derivatives, the phosphorylation route being determined by the nature of the substituents on the nitrogen and carbon atoms in the acid amide molecule. Imidoyl- and amidophosphites are isomerized into imidoylphosphonates. Iminized products of imidoyl- and amidophosphites are rearranged into phosphorylated amidines. References 9: 8 Russian, 1 Western.

12765/9716
CSO: 1841/599

UDC 547.241

ESTER CHLORIDES OF DI- AND TRICHLOROMETHANE PHOSPHONIC ACID

Leningrad ZHURNAL OBSHCHEY KHIMII in Russian Vol 56, No 6, Jun 86 (manuscript received 11 Jan 85) pp 1280-1282

[Article by G.G. Blinova, A.N. Lavrentyev, L.N. Melnikova and L.A. Panova, Leningrad Technologic Institute imeni Lensovet]

[Abstract] Ester chlorides of di- and trichloromethane phosphonic acids have not been well studied, although they are of interest as possible starting materials for pesticides. They may be prepared either from the dichloride by reaction with alcohols, or from complete esters by reaction with phosphorus pentachloride, although in the latter case some dichloride is also formed and the proximity of boiling points makes fractionation difficult. In the reaction employing alcohols, complete esters are also formed, but they can be easily separated by distillation and this reaction was used to prepare

previously unknown ester chlorides of tri- and dichloromethane phosphonic acids. The stability of the ester chlorides was found to be related to the structure of the radical in the ester group. References 7: 4 Russian, 1 Western.

12765/9716
CSO: 1841/599

UDC 541.138:547

ELECTROCHEMICAL BEHAVIOR OF BORON-ORGANIC COMPOUNDS

Leningrad ZHURNAL OBSHCHEY KHIMII in Russian Vol 56, No 6, Jun 86 (manuscript received 20 May 85) pp 1294-1299

[Article by Zh.Kh. Urtayeva, A.A. Bumber and O.Yu. Okhlobystin]

[Abstract] The nucleophilic and electrophilic properties of compounds can sometimes be evaluated if the electrochemical redox potentials are known. In the present work a study was made of the electrochemical behavior of trimethyl-, tributyl-, triphenyl-, tri- α -naphthyl- and trimesitylboron and their complexes with ammonia and pyridine. The results show that the most simple boron-organic compounds are oxidized with difficulty, and that the values of the anode peak potentials cannot be used to evaluate their reactivity with oxygen. Complex formation increases the capability of boron-organic compounds to enter electrochemical oxidation. Reduction of triarylborons on a dropping mercury electrode results in the formation of anion radicals, and the rate of dimerization of the latter is a function of the solvating capacity of the solvent. Figures 2; tables 2; references 21: 15 Russian, 6 Western.

12765/9716
CSO: 1841/599

PETROLEUM PROCESSING INDUSTRY

CONVERSION OF PETROLEUM SECTOR TO NEW ECONOMIC SYSTEM

Moscow PLANOVOYE KHOZYAYSTVO in Russian No 10, Oct 86 pp 66-71

[Article by S. Polotskiy, chief of the Planning-Economic Administration of the USSR Ministry of Petroleum Refining and Petrochemical Industry; V. Zhelezov, deputy chief of the Planning-Economic Administration of the USSR Ministry of Petroleum Refining and Petrochemical Industry, and candidate of economic sciences; and R. Dunyushkina, laboratory head of the All-Union Scientific-Research Institute of Oil and Gas, and candidate of economic sciences: "Converting the Sector to the New Conditions of Economic Management"; first paragraph in boldface in source]

[Text] Selection of Plan and Evaluational Indicators * Assessing the Results of Activity of Enterprises According to the Indicator of Net Output * The Advantages of Using Indicators of Net Output in the Petroleum Processing and Petrochemical Industry

The 27th CPSU Congress and the June (1986) Plenum of the CPSU Central Committee set the task of developing an anti-expense economic mechanism which rewards the development of production with maximum economizing on all types of resources. One of the main elements of creating such a mechanism is the selection of plan and evaluational indicators which reflect the real contribution of labor collectives to the final results of their activities. The course undertaken demands decisive rejection of indicators which make it favorable for associations and enterprises to have increased expenses, or to raise the volumes of production by bringing in greater and greater volumes of raw materials, and material and energy resources. It also calls for establishing interconnections between incentives to labor collectives and the final economic results.

The conversion of enterprises to the new conditions of economic management which is now going on in the industry is orienting them toward resolving the assigned task by means of strengthening the interconnection between the sizes of wage funds formed by enterprises and technical and social development, between material incentives and an increased volume of production, labor productivity, and reduced expenses for production. At the same time, enterprises are not being given adequate incentives to raise the effectiveness of use of raw materials and material resources. This has been demonstrated particularly in the petroleum processing and petrochemical industry.

The main task of the sector consists of, in the near future, supplying the economy's demand for motor fuels and raw materials for petrochemical and other products without increasing the oil resources, but rather simply through accelerated development of processes of intensification and raising the effectiveness of refining oil. In order to do this, in the 12th Five-Year Plan and in the future it is necessary to use as secondary raw materials a significant portion of the fuel oil which constitutes a substantial fraction of the final volume of production. Processing it and manufacturing valuable motor fuels demand the creation of modern processes of complete refining [glubokaya pererabotka] of oil. Adopting them will ensure a vast economic effect through conservation of oil resources, inasmuch as raising the yield of light petroleum products by only 1 percent reduces the economy's need for capital investments by 2 billion rubles. The effectiveness of production will also grow significantly in the petroleum refining industry, which will achieve a very rapid increase (by a factor of 1.5) in profits as compared to the volume of commercial output [tovarnaya produktsiya].

But an analysis of the dynamics of indicators of the effectiveness of production revealed a paradoxical situation: the intensive path of development of the sector in the direction of effective use of raw materials resources, and complete refining of oil with effective evaluation indicators, leads to a fall in growth rates of the volume of production, labor productivity, and capital productivity. In this situation, the economic indicators worsen as the extent of oil refining increases.

It is well known that at the present time the results of the activity of enterprises are determined according to commercial output, which does not reflect the effectiveness of use of raw materials and material resources. In the petroleum refining and petrochemical industry, in calculating labor productivity and capital productivity according to this indicator, the simplest technological processes become advantageous. The use of secondary resources, which substantially improve the quality of the petroleum products produced and ensure more complete refining of oil, have a negative effect on these indicators, giving the false impression that they are ineffective.

Under the new conditions of economic management, the inadequacies of the indicator of commercial output are aggravated still further, since the normatives of increasing the wage fund must be established per percent of increased volume of production. In addition, it also fails to allow for fully resolving the social task, which was reflected in the increase of average wages, which equaled a total of only 9.4 percent in the 11th Five-Year Plan in petroleum refining industries, while it was 113 percent on average throughout the economy, and in the 12th Five-Year Plan will come to only 6 percent, with 113-115 percent throughout the economy.

In a number of petroleum refining enterprises, in connection with a reduced volume of petroleum refining for various reasons, the volume of commercial output is also decreasing, which, in turn, inevitably leads to reduced wages and material incentive funds. Therefore, in the preparations of the USSR Ministry of Petroleum Refining and Petrochemical Industry to convert to the new conditions of economic management beginning in 1987, there has arisen the

problem of selecting an indicator for evaluating the effectiveness of the activities of enterprises, and labor productivity. The ministry has proposed adopting an indicator of net output to evaluate labor productivity and the formation of the wage fund. The proposal has been approved by the USSR State Planning Committee.

The indicator of net output is distinct from normative net output used by many ministries by the fact that the latter is formed according to fixed normatives for all product types without taking into account material expenses.

From 1980 to 1982, 40 enterprises of the Ministry of Petroleum Refining and Petrochemical Industry conducted an experiment in using the indicator of normative net output. As analysis showed, in enterprises with continuous and integrated processes of production, multivariant systems of processing raw materials and obtaining the final product, and widely developed and flexible interplant cooperation, the development of stable normatives of net output, reflecting volumes of an enterprise's own completed projects, does not yield positive results. And, the main thing, this indicator does not take into account nor provide incentives for reducing material expenses, and does not adequately reflect the effectiveness of use of raw materials resources, or the extent of oil refining. Therefore, in accordance with the USSR State Planning Committee, the experiment was halted in 1983.

In contrast to normative net output, the indicator of net output does not require the development of additional price lists, but is determined throughout the enterprise by subtracting material outlays and depreciation from commercial output. The advantage of this is that it takes into account the economizing on material resources achieved in each specific period, and it objectively reflects the effectiveness of use of raw materials resources.

Net output also has advantages over the "gross" indicator--commercial output, since it does not depend on the mass of material outlays and rules out their possible secondary effect, but at the same time it takes into account economizing on them and only that value which is created by the labor of the collective in question. In addition, it most fully reflects the efforts of labor collectives to use intensive factors of increasing production.

Based on the indicator of net output, it is possible to determine rates of growth of labor productivity, and also to form the wage fund. This is manifested especially graphically in the petroleum refining industry, where a qualitative change in the use of raw materials is occurring. In the 12th Five-Year Plan, the rates of growth of net output in the sector should be 5 times greater than the rates of growth of commercial output. A substantial increase is also expected in shale processing--it should double.

The data presented attest that the greatest divergences between rates of growth of commercial output and net output are observed in sectors which process the primary raw materials--the oil refining and shale processing sectors. Clearly, in these sectors the effect from improved use of raw materials will be most fully manifested in net output. This is connected with the fact that when evaluation is based on net output, secondary processes of processing raw materials become more effective in comparison with primary

processes. It is clear that this path is the correct one and will substantially change the choice of priority direction of development of processing sectors.

| | 1990, as % of 1985 (Plan) | | |
|---|------------------------------|-----------------------|------------|
| | <u>Commercial Output</u> | <u>Net Output</u> | <u>+1-</u> |
| USSR Ministry of Petroleum Refining and Petrochemical Industry | 114.0 | 137.0 | +23.0 |
| Specific industries: | | | |
| Petroleum refining | 108.5 | 143.7 | +35.2 |
| Petrochemical | 121.8 | 131.6 | +10.8 |
| Shale processing | 116.9 | 134.9 | +18.0 |
| Machine building | 121.0 | 125.1 | + 4.1 |

Evaluation according to the indicator of net output in the petroleum refining and petrochemical industry will make it possible to determine more objectively their contribution to raising the effectiveness of social production and thus to increase responsibility for ensuring it; to reflect the correlation between rates of growth and labor productivity and wages in accordance with the final results and the amounts of their material incentives; in petroleum refining enterprises, to avoid unjustified reduction of the assessment of the volume of production and labor productivity in places where not as much petroleum is refined but use of it is improved, including through secondary processes.

In analyzing the dynamics of net output, it is necessary to focus attention also on the equalization of assessments of the rates of growth of volume of production throughout the subsectors of the USSR Ministry of Petroleum Refining and Petrochemical Industry, which testifies to the relative equality of planned rates of increasing the effectiveness of production as well as to the equal intensity of previously determined plan targets. In addition, the absolute level of labor productivity of the sectors, when it is evaluated according to the indicator of pure production, approaches substantially closer to commercial output (the average spread is reduced by a factor of nearly 3). In the petroleum refining industry, output according to the indicator of net output is 60 percent higher per single worker than in the petrochemical industry, while according to commercial output it is 3.7 times higher. This makes it possible to reduce the distorting effect of the changed sectorial structure of production on the dynamics of growth of labor productivity throughout the ministry as a whole.

At the same time, use of the indicator of net output is connected with certain difficulties of a methodological and practical nature. It is well-known that in the 1970's the machine-building sector conducted an experiment in using the indicator of net output and, despite results which were positive on the whole, its use did not become widespread. The main reasons were difficulties in accounting and calculating the indicator of net output, in particular: defining it in comparable prices; distinguishing elements of net output in complex items [kompleksnye statii] of estimating expenses for production, since this is not provided for by accounting records; obtaining usable data on net output on the first or second day after the end of the fiscal month.

Therefore, the USSR Ministry of Petroleum Refining and Petrochemical Industry has developed concrete proposals for eliminating the shortcomings. Jointly with the sectorial institute (the All-Union Scientific-Research Institute of Petroleum Refining), the ministry has drawn up a draft of Methodological Directives concerning the order of planning and use of the indicator of net output in production associations (enterprises) of the petroleum refining and petrochemical industry, approved by the USSR State Planning Committee and USSR Central Statistical Administration.

Determining the dynamics of net output in comparable prices. Currently, in determining the dynamics and expenses per 1 ruble of commercial output at existing prices, commercial output and its prime cost are calculated at the prices of the preceding year. But fulfillment of the plan in these indicators is determined according to actually existing prices. This methodology of calculation complicates evaluation of the dynamics of growth and fulfillment of the plan of commercial output in uniform prices--that is, commensurability of the plan and report data. In connection with this, in our view it is necessary to calculate the volume of net output in unified prices (at the existing wholesale prices of enterprises which were adopted in the plan). In order to determine the dynamics of net output, enterprises must carry out a conversion of commercial output and material outlays of the preceding plan year according to the methodology, structure, and wholesale prices adopted in the plan of the current plan year.

Delineating the elements of net output in integrated types of expenditures. Part of net output is contained in complex items of expenditures, including expenditures relating to "nonproduction expenditures" accounts, the assimilation of new technology, the remaining portions of "uncompleted production," "expenses of future periods," and so forth. In order to determine the elements of net output and material expenditures in these types, it is necessary to have a detailed breakdown of all expenditures, classifying them either with net output or material expenditures, depending on their economic content. This approach does not guarantee precision of calculation, since there is no monthly accounting with a breakdown of expenditures.

Based on a calculation of net output, we propose making an estimate of expenditures for production, broken down element by element. In order to determine the volume of net output, it is necessary to exclude from commercial output the value of gross material expenditures according to the estimate of expenditures for production and estimated depreciation allowances relating to expenditures for production.

Analysis has shown that the overwhelming portion of expenditures in complex items of expenses written off in "nonproductive accounts" in the petroleum refining and petrochemical industry constitute expenditures to carry out projects of assimilating new technology and increased expenses of the first year (in special cases, an even lengthier period of time) for assimilating series (mass) production of new types of goods paid for from the unified fund of development of science and technology. Therefore, in calculating net output it is necessary to add to the volume of commercial output the cost of projects connected with assimilating new technology, and then to subtract from this volume the material expenditures and depreciation allowances.

Under this condition, the volume of net output (NO) may be calculated according to the following formula:

$$NO = CO + NT - (ME + DA),$$

where

CO - commercial output at the existing comparable prices adopted in the plan;

NT - volume of expenditures for the assimilation of new technology and increased expenditures of the first year of series production of new types of goods financed from the unified fund of development of science and technology;

ME - gross material expenditures according to an estimation of expenditures for production;

DA - the depreciation allowances relating to expenditures in production.

The proposed method of calculating net output of enterprises in the period of widespread assimilation of new technology will to a significant degree level out the worsened economic indicators, and at the same time provide enterprises with incentives to adopt it (it is not necessary to give any attention to other complex items of expenditures). This ensures the simplicity and reliability of calculation of this indicator under existing methods of accounting and calculation. Its use will also provide enterprises with incentives to reduce the remaining portions of uncompleted production.

Effectiveness of using the indicator of net output. According to the data of accounting reports, net output is calculated on the 10th or 12th day of the month following the report period. Therefore, in order to secure an effective accounting and evaluation of activities, it is proposed to determine it within approximately the same time periods as the commercial output. A preliminary volume of net output may be calculated by multiplying commercial output of the report month by the fraction of net output in commercial output for the plan of that month. A more precise volume of net output will be reflected in the report for the next accounting period based on accounting data.

But in assessing the volume of production and labor productivity, the indicator of net output, in comparison to commercial output, is directly connected with the indicator of profits. When commercial output was used, nonfulfillment of the plan with regard to profits or too-slow rates of growth of profits were not reflected in judging fulfillment of the plan and the dynamics of assessing the volume of production and labor productivity; when net output is used, however, such will lead to an assessment of nonfulfillment of the plan or too-slow rates of growth of these indicators.

Since the value of the indicator of net output is 5 times smaller than commercial output, its oscillations at the level of fulfillment of the plan

will be more perceptible for enterprises and the sector as a whole than the indicator of commercial output. At the same time, the indicator of pure production ensures objectivity in evaluating the activities and technical development of the sector.

In providing incentives for increases in commercial output at determined and confirmed targets for the production of goods, we are at the same time promoting increased prices and material expenditures. But when incentives are provided for increased net output, enterprises try to fulfill the confirmed plan for the products list at maximum inexpensiveness--that is, an anti-expense mechanism comes into effect in this case. Thus, the fundamental difference between the indicators being examined and the advantage of the indicator of net output is graphically demonstrated here. But at the same time, it is important to correctly construct the system of forming the wage fund depending on the growth of net output.

Evaluating the results of work of enterprises according to the indicator of net output creates the conditions for converting the USSR Ministry of Petroleum Refining and Petrochemical Industry to full cost-accounting. The mass of profits forming in the sector will ensure not only satisfaction of all the needs of industry, but will also promote steady deduction of a substantial portion of the profits into the state budget.

The conversion beginning 1 January of 1987 of the enterprises of the USSR Ministry of Petroleum Refining and Petrochemical Industry to the use of the indicator of net output in planning and in evaluating industrial activity, as well as the conversion to full cost-accounting, is of interest for its future spread into other sectors of the national economy. This is connected with the fact that the ministry includes a broad complex of greatly varied production facilities: with continuous equipment processes in petroleum refining and shale processing; various stages of organization of technological processes in the production of synthetic rubber; a combination of automated and manual-machine processes and operations in the tire and industrial rubber industry; the technology of conveyor belt assembly in the production of rubber footwear; and also machine-building enterprises.

This great variation in the nature and scale of types of production combined in the single complex of the USSR Ministry of Petroleum Refining and Petrochemical Industry will make it possible to develop in practice and evaluate the effectiveness of the new economic mechanism as applied to various industrial enterprises.

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12255

CSO: 1841/15

COMPRESSED NATURAL GAS TO FUEL VEHICLES

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 29 Aug 86 p 1

[Article: "At the Politburo of the CPSU Central Committee"]

[Excerpt] The Politburo has approved the test and the proposal for wide spread use of natural and liquefied petroleum gas as motor fuels. It commissioned planning and management bodies to increase production of trucks, specialized vehicles, buses, and municipal service vehicles which use highly compressed natural and liquid petroleum gas, and ordered them to build and operate facilities to fuel such vehicles. Accomplishing these steps will significantly decrease the use of gasoline and diesel fuel.

9016

CSO: 1841/2

FIRST DELIVERIES OF YAMBURG GAS

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 23 Sep 86 p 1

[Article: "Yamburg Gas Has Arrived at the Enterprises"]

[Text] Yamburg (TASS) -- Tyumen-area gas workers began this working week with a happy occurrence. Industrial exploitation of the Yamburg Gas Deposit, located on the shore of the Arctic Ocean, has begun. Yesterday, Yamburg gas arrived at enterprises in the cities in the European part of the country six months ahead of schedule.

"We couldn't ask for more than the pace maintained during Yamburg construction," said the Chief of Glavtyumengasprom [the Main Tyumen Directorate for the Gas Industry], Deputy Minister of the Gas Industry Ye. Yakovlev. "Our stake in non-traditional construction technology has been totally vindicated. The gas processing complex was prefabricated in super units at plants in Tyumen, and then delivered via the Siberian rivers to the deposit, where they had only to be put in place. Earlier, we had built a steel underground pipeline more than 3,000 kilometers long, linking Yamburg with the central regions of the country."

Yesterday we produced the first yield from the deposit, which is supposed to provide almost all of the growth in gas extraction in the country for this Five-Year Plan. And there are new super units being unloaded at the ports. By the end of the navigation season we will have completed shipping all the necessary loads for the follow-on unit. The gas workers have resolved to complete this unit ahead of schedule also.

9016

CSO: 1841/2

YAMBURG GAS DELIVERIES REPORTED

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 24 Sep 86 p 2

[Article by TASS Correspondent Ya. Ali-Zade exclusive to 'Sotsialisticheskaya Industriya': "Yamburg is On Line"]

[Text] Moscow -- A new line, Yamburg, has appeared on the display screens of the central dispatching directorate for the Ministry of the Gas Industry. The first millions of cubic meters of natural gas from this giant deposit have appeared in the energy arteries of the nation ahead of schedule. It is from right here, from the shore of the Arctic Ocean, that we intend to provide all of the growth in "blue fuel" for this entire Five-Year Plan. Commenting on this event to our TASS correspondent is the Minister of the Gas Industry, V. Chernomyrdin.

[Chernomyrdin] This deposit, second in size only to Urengoy in our country, is now on line. This day has been impatiently anticipated by the geologists and scientists, transporters and builders, power engineers and linesmen -- everyone who participated in the development of Yamburg. And they expended maximum effort on it, even though this deposit on the Tazovskiy Peninsula has been a tough nut to crack. There were a number of surprises provided by the climate and the geological conditions. We had to find a non-traditional approach to solve the problems which came up, and had to experiment bravely.

[Interviewer] Please tell about the more significant of these.

[Chernomyrdin] First of all, there was the unit-complex [bologhno-komplektnyy] method for equipping the gas fields. This engineering step alone allowed us to decrease the time it took to build the deposit, and start industrial production from Yamburg five months ahead of schedule.

Unit floats weighing several hundred tons were built by the collectives of the "Sibkomplektmontazh" Association in Tyumen. Using these units, which were at a high state of completion from the plant, we installed powerful units for complex gas treatment, compressor stations, and power plants in Yamburg. This very progressive method actually turned out to be singularly useful. It allowed us to work without supplementary expenditures, and, the main thing was that we could get the deposit on line quickly.

[Interviewer] As is known, the success of a project is decided, in the final analysis, by the people. We would like to know about the living and working conditions today for the gas workers at this deposit beyond the Arctic Circle.

[Chernomyrdin] We cannot escape the fact that the people at Yamburg are carrying out an especially important task. They are earning all sorts of praise. At meetings of a party-management activ for the Tyumenskaya and Tomskaya Oblasts it was emphasized that the attitude toward people and providing for them is the main thrust of our policies. And this has special significance for development of new regions. It is gratifying that attention to the gas field workers and to their working and living conditions has recently increased significantly. We plan to more than quintuple the resources devoted to solving the problems of providing living quarters and communal and cultural services, in comparison with [the amount of resources expended during] the 11th Five-Year Plan.

The first priority in Yamburg is construction of a well-equipped settlement for 9,000 persons. Furthermore, construction has started on additional stores, clubs, and other social and cultural facilities. Also, a decision has been made to provide living quarters in Urengoy, Tyumen, and Nadym for vakhtovyy workers. [Note: Vakhtovyy workers are those who are transported to a work site which is physically distanced from their place of residence.]

[Interviewer] We in our country have amassed a great deal of experience in developing the fuel riches located in the severe conditions of the North. Were the errors made in previous years taken into account in the case of Yamburg?

[Chernomyrdin] As a matter of fact, it was primarily due to the experience we had accumulated that we were able to effect savings at this trans-arctic deposit and to cut back on expenditures. This does not mean, however, that we have learned from all the lessons of the past. Unfortunately, many mistakes were made this time as well.

This happened, for example, in drilling. Late construction of roads had a harmful influence on the sequencing of operations and violated the established work schedule.

Construction of an airport was delayed, and the specialists from the Ministry of Highway Construction and Maintenance [Mintransstroy, evidently the RSFSR Mintransstroy] also failed to meet schedules for road construction and other very important projects.

We still have to make a careful analysis of the work which was done and to evaluate it from both the technical point of view and the economic. This is very important. In fact, starting up the first resources is only the beginning of development. Yamburg is the first beachhead for the deployment of gas workers across a wider front.

9016

CSO: 1841/2

MAGNETIC PIPELINE LUBRICANTS

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 4 Oct 86 p 2

[Article by TASS Correspondent K. Stolyarchuk: "Magnetic Metamorphoses"]

[Text] The miracles in the flask, as demonstrated to the observers in the hydraulics and heat technology laboratory by the scientists of the Belorusskiy Technological Institute imeni S. M. Kirov, are by no means just laboratory curiosities. They illustrate the unusual capabilities of magnetic liquids, and the sphere of their use in the economy.

Professor V. Medvedev added a black liquid to turbine oil, and brought a magnet near to it. And the drop in the flask bristled up into sharp arrows, and started to look like a hedgehog. The scientist is showing yet another "strange" experiment. The liquid, which was just poured into the tube, no matter how much I shake it, will not flow out of it. The explanation is that it is in a magnetic film.

The liquid has these unusual qualities due to the action of the external magnetic fields, explain the institute's fellows, who have taken up the matter of using the surprising properties of the new material. Nearby, an experiment is ending on one of the pieces of equipment. Oil workers are awaiting its results, and they are placing a great deal of hope on the use of the magnetic liquid in the pumping of liquid fuel.

"The experiments confirm that it is possible without great expenditures to multiply by several times the throughput capability of pipelines," continues V. Medvedev. "A tanker is loaded, for example, with thick mazut [heavy bunker oil]. The loading time may be halved if the stuff did not stick to the walls of the pipe, and could flow through a liquid 'sleeve', which is held there by magnetic forces. And this is quite real. We have done an experiment in making elastic materials which have magnetic properties..."

A monotone hum is heard in the next room of the laboratory. Checkout has begun on a test sample of an original system which was hypothesized by the scientists. They solved a complicated problem, and found a method to avoid the outflow of oil from the gas pumping units at high pressures of transfer. They created a reliable hermetic system, The specialists from the Production Association "Zapadtransgaz" [Western Gas Transportation]", with whom a

contract has been signed for adopting it, have placed great value in its virtues. It is useful in servicing where it promises a significant savings of a scarce material and has a broad range of useful parameters.

The "bristly" liquid has attracted the attention not only of engineers, but also of medical personnel, ecologists, and technologists. This is witness to the great promise of using the material across the broadest range of branches of industry.

9016
1842/2

GAS FROM KARAKUM DESERT

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 4 Oct 86 p 4

[Article: "Gas from the Karakum Desert"]

[Text] Chardzhou -- Gas flow has begun from the Malaya Field in the Eastern Karakum and has started to be pumped into the Central Asia - Center pipeline.

The builders of the gas fields in the Karakum work under difficult conditions. Everything has to be hauled into here over a distance of several hundred kilometers. But nevertheless exploitation of the deposit has been done in a short period. There has been a road, a water line, and power lines laid across the dunes to Malay, and a well-equipped vakhtovyy settlement [a remote settlement for temporary workers] has been built there. A great deal of gas-drilling equipment has been delivered to the field in pre-assembled units. The brigade method of work is widely used by these construction workers.

Five million cubic meters of fuel will be sent from here to the European part of the country each year. Next year when the field reaches its planned capacity the deliveries of gas to the central regions will double.

9016

CSO: 1841/2

SAMOTLOR OIL PRODUCTION

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 12 Oct 86 p 1

[Article by Correspondent G. Bazhutin: "Samotlor: A Debt Repaid" under the rubric: "Action Sotsialisticheskaya Industriya and Tass: The Petroleum of Western Siberia"]

[Text] Nizhnevartovsk -- Today there were two major events in the giant West Siberian Association "Nizhnevartovskneftegaz." The debt to the state which has been piling up since the beginning of the year was totally repaid. And two billion tons of "black gold" have been extracted from this single petroleum-producing region.

In April, our paper reported that after a four-year lag the Samotlor oil field workers had reached their planned level for daily extraction. At that time the debt was 1.5 million tons. A lot of people thought that they would not be able to clear this debt by the end of the year. But this important goal has been accomplished.

"As decreed by the CPSU Central Committee via the Nizhnevartovsk City Party Committee, we were to receive constant attention from the ministry, and from party organizations of the oblast, and this was a great help to us in establishing a reliable basis for acceleration," said the General Director of the Association, L. Filimonov. "We managed to set up a mechanism for mutual relations with many of our neighbors, and to provide a more precise rhythm for equipment deliveries, and to improve the engineering support to production, and find the optimum ways to deploy our people. The main thing was that there was a decisive change in the consciousness of the oil field workers. They believed in their power, and got to work. The capabilities of Samotlor are far from exhausted."

For a long time well repair was considered to be the weakest link in the association. It was not only the repair force that was guilty in this area. Often they lost a whole shift in waiting while the necessary parts and equipment were delivered to them from various delivery enterprises. They managed to overcome these constant shortcomings, once the workers themselves took control of rational use of equipment. The repairmen and drivers set up unified brigades wherein work was evaluated in terms of final results, in their operability and in the quality of work.

It was mainly due to such organization that they managed to solve a pressing problem in Samotlor -- how to reactivate hundreds of wells which had been shut down.

It was mainly due to such organization that they managed to solve a pressing problem in Samotlor -- how to reactivate hundreds of wells which had been shut down.

An important role was played by the leaders helping those who were lagging. A collective of the leading petroleum-extraction directorate, "Megionneft," for example, took over management and very quickly they raised the totals of the "Novomolodezhninskneft" NGDU [Oil and Gas Extracting Directorate]. The specialists from Megion, and the masters from their best brigades provided assistance to their neighbors in solving complex geological tasks. And now the oil field workers of this young enterprise have raised their own indicators to the level of those who helped them.

Having cleared their debt, the Nizhnevartovsk petroleum workers have now set a new goal for themselves. They have resolved to exceed the plan for extraction by one million tons of petroleum by the end of the year.

9016

CSO: 1841/2

UDC 550.836:553.98

STUDY OF DATA FROM HYDROMETEOROLOGICAL SERVICE TO SOLVE CERTAIN PROBLEMS IN
METHODOLOGY IN GEOTHERMAL SURVEYING

Baku AZERBAYDZHANSKOYE NEFTYANOYE KHOZYAYSTVO in Russian No 6, Jun 86 pp 3-7

[Article by R.Ya. Sudzhadinov, Southern All-Union Scientific Research Institute
of Geophysics]

[Abstract] Ground temperature data, collected by the Sumgait Hydrometeorological Station, located 10 km south of the Sovetabad Platform, from depths ranging from 0.2 - 3.2 m, showed that the most favorable times for geothermal prospecting are Feb-Mar and Jul-Aug, when there is minimal ground temperature fluctuation. The study also showed that data collected by the hydrometeorological service can be successfully used to lower the volume of drilling operations for geothermal bore holes resulting in a savings in time and materials, as well as labor involved in taking numerous temperature measurements. Figures 3; references 3 (Russian).

12765/9716

CSO: 1841/598

UDC 622.279.1/4.04

REWORKING GAS CONDENSATE DEPOSITS OF BED VIII OF SANGACHALY SEA - DUVAN SEA -
BULLA ISLAND OIL FIELD

Baku AZERBAYDZHANSKOYE NEFTYANOYE KHOZYAYSTVO in Russian No 6, Jun 86 pp 7-10

[Article by N.A. Akperov, VPO Caspian Sea Oil and Gas Industry, A.I. Aliyev, N.V. Ali-Zade, O.E. Karash, (GNIPIGipromorneftegaz) [State Scientific Research and Planning Institute of Offshore Oil and Gas], and S.M. Kasumov, Oil and Gas Producing Administration imeni N. Narimanov]

[Abstract] The gas-condensate-bearing strata of bed VIII of the title deposit is confined to the NE sector of a fold transversely broken up into six tectonic blocks. Currently, 15 wells in blocks 4,5 and 6 are producing. An analysis shows that the gas-condensate lode in bed VIII is not draining evenly and that new wells must be drilled to maintain designed production. Block 6 currently has the lowest production index, although the absolute values are

high. This is because until recently all wells were concentrated in a section of the block subject to tectonic breach, and as new wells started to produce and forced production was initiated in others, the drainage zone widened but the spacing between wells remained uneven, with no wells at all in the eastern portion. It is recommended to drill four new wells here. A single well is being bored in block 4 and boring is also indicated for block 5. Figures 2; references 2 (Russian).

12765/9716
CSO: 1841/598

UDC 622.276.652

RESULTS OF INJECTING STEAM INTO OIL FORMATION WITH SUBSEQUENT WATER FLOODING IN AZERBAIJAN DEPOSITS

Baku AZERBAYDZHANSKOYE NEFTYANOYE KHOZYAYSTVO in Russian No 6, Jun 86
pp 11-13

[Article by I.M. Dzhamalov, Azerbaijan Scientific Research and Design Institute for Oil]

[Abstract] The process of steam injection followed by flooding with water was started in Azerbaijan oil fields in 1969. Presently, this process is being used at places on the Khorasany platform (bed II KS₄), Binagadi-Kirmak (KS₄ and KS_{5a+b}) and Puta-Kushana. The process is conducted at 550-700 m depths, 60,000-222,000 n.², flooding to 50%, with up to 10% paraffin and 30% asphalt content in the crude at 20-80 nPa's viscosity. Practice shows that interruption of the steam injection complicates operations in the flooding wells and has a negative effect on the process. The steam injection must be conducted simultaneously throughout all the water injection wells as called for in the specifications. Positive results were obtained using thickening mud as a heat shield.

12765/9716
CSO: 1841/598

UDC 622.276.1/4

OPTIMAL VOLUMES OF WATER INJECTION DURING LATTER STAGES OF OIL PRODUCTION

Baku AZERBAYDZHANSKOYE NEFTYANOYE KHOZYAYSTVO in Russian No 6, Jun 86 pp 16-18

[Article by G.V. Klyarovskiy and B.G. Parakhin, Ukrainian State Scientific Research and Design Institute for Oil]

[Abstract] Large volumes of water pumping, high water content in the crude and an insignificant increment in oil production during the latter stages of oil well depletion show diminishing returns for further water injection, and the question of optimizing the volume of water injection and converting a highly watered oil deposit to depletion conditions with decreased stratum pressure and the formation of free gas becomes critical. A study shows that it

pays to gradually decrease water injection and convert to a mixed production regime. In the case under study, water injection was decreased by 40%, and while this resulted in a 9% drop in oil production, there was a 1.8-fold increase in casing head gas output and a 16% drop in operating costs. Figures 1; references 2 (Russian).

12765/9716
CSO: 1841/598

INTENSIFICATION OF DEVELOPMENT OF HYDROGENATION PROCESSES IN OIL REFINING

Moscow KHIMIYA I TEKHNLOGIYA TOPLIV I MASEL in Russian No 9, Sep 86 pp 2-4

[Article by Ye.D. Radchenko, V.M. Kurganov and T. Kh. Melik-Akhnazarov]

[Abstract] The future of intensified hydrotreating of motor fuels is to be found in the introduction of modern combined automation systems using micro-processor equipment and computers to greatly increase labor productivity. The use of fine extruded catalyst can reduce hydrotreating temperatures by 10-20°C, increasing the working life of catalyst and decreasing fuel and reagent consumption by 10-15%. Use of heavier crude will require an increase in hydrogen consumption and introduction of membrane separation and short-cycle adsorption of gases. Shortcomings have been found in design decisions concerning heat exchange in combined installations. Hydrotreating and catalytic cracking units must be improved in terms of use of energy resources. Use of GK-8 catalyst can decrease the temperature of the process of diesel fuel production by 10°C, achieving product yields of 100% of the initial raw material mass. Hydrocracking at 10MPa can reduce capital investment and power consumption. Hydrocracking at 5MPa achieves still lower capital investment and significant power savings.

6508/9716
CSO: 1841/84

UDC 665.658.2

REFINING OF GASOLINES FROM THERMAL PROCESSES

Moscow KHIMIYA I TEKHNLOGIYA TOPLIV I MASEL in Russian No 9, Sep 86 pp 20-23

[Article by G.A. Berg, G.G. Telyashev, T.S. Kirillov, L.A. Kalinsheva, Bashkir Scientific Research Institute of Oil Refining, Novo-Ufa Oil Refinery]

[Abstract] The essence of selective hydrotreating of gasoline is selective hydrogenation of organic sulfur compounds and the more unstable unsaturated hydrocarbons at relatively low temperatures and high speeds, yielding gasoline of lower sulfur content. Designs have now been developed for two types of new installations: For hydrogenation of secondary gasoline in pure form, and in mixture with a hydrogenate. Studies of combined hydrotreating of secondary gasolines with straight-run diesel fuel were performed on pilot installations using mixtures containing 20 and 30% gasoline, 80 and 70% straight-run diesel

fuel from high-sulfur crude. Gasoline produced by hydrotreating following thermal cracking was found to be equal in quality to straight-run gasoline. Testing with lower-sulfur crude indicated that the maximum gasoline quality was achieved with a ratio of 8:92. The plant operated with this mixture for two months. The gasoline obtained was superior in quality to straight-run gasoline except for content of unsaturated hydrocarbons. The process utilizes the abundant diesel fraction raw material and avoids the temperature increases resulting from the exothermic effect of hydrogenation of unsaturated hydrocarbons. References 7 (Russian).

6508/9716
CSO: 1841/84

UDC 665.658+665.753.4

PRODUCTION OF LOW POUR POINT DIESEL FUELS BY CATALYTIC DEPARAFFINIZATION

Moscow KHIMIYA I TEKHOLOGIYA TOPLIV I MASEL in Russian No 9, Sep 86 pp 29-31

[Article by I. T. Kozlov and Ye. A. Yakovleva, All-Union Scientific Research Institute of Oil Refining]

[Abstract] In order to lower the pour point of diesel distillates, depressor additives are used. However, they have almost no effect on turbidity temperature. The process of catalytic deparaffinization allows radical improvement of low-temperature properties of diesel fuels without reducing the selection of light products from crude. The process is performed with a catalyst based on high-silicon zeolites, and allows selective removal of high pour point normal paraffin hydrocarbons from straight-run diesel distillates. Experiments indicated that the service life of a deparaffinization catalyst is somewhat higher when a two-stage system is used rather than a single-stage system, due to the absence of hydrocarbon gases, gasoline distillate and hydrogen sulfide from the reaction zone and the resultant higher partial pressure of hydrogen in the reactor. Service life of the catalyst was estimated as 8 months.

6508/9716
CSO: 1841/84

POLYMERS AND POLYMERIZATION

UDC 541.127+678.744.423

ABILITY TO REGULATE MOLECULAR PROPERTIES OF POLYVINYLACETATE BY ALTERING PHYSICAL PARAMETERS OF STIMULATING LASER IRRADIATION DURING INITIATED BULK POLYMERIZATION OF VINYLACETATE

Yerevan ARMYANSKIY KHIMICHESKIY ZHURNAL in Russian Vol 39, No 8, Aug 86
(manuscript received 14 Feb 86) pp 482-485

[Article by G.E. Safaryan, L.Kh. Simonyan, R.O. Chaltykhyan, N.M. Beyleryan and G.A. Kazaryan, Yerevan State University]

[Abstract] Recently, several studies appeared on stimulation of polymerization processes and regulation of their molecular weights by laser irradiation. Because the range of variations with a ruby laser is limited, in the present study, nitrogen laser was used to regulate molecular mass distribution and branching within a sample of polyvinylacetate. Isobutyronitrile was used as the initiator. It was shown that increasing the frequency of laser radiation impulse repetition led to a narrower distribution of molecular mass and a smaller degree of branching within the polymer sample. Figures 3; references 9: 7 Russian (1 by Western author), 2 Western.

7813/9716
CSO: 1841/82

UDC 678.02:66.095.26+678.046.3

NEW APPROACH TO FORMATION OF POLYMER COMPOSITES

Yerevan ARMYANSKIY KHIMICHESKIY ZHURNAL in Russian Vol 39, No 8, Aug 86
(manuscript received 18 Nov 85) pp 508-511

[Article by G.B. Ayvazyan, S.M. Ayrapetyan, A.K. Badalyan, L.A. Akopyan and S.G. Matsoyan, Institute of Organic Chemistry, ArSSR Academy of Sciences, Yerevan]

[Abstract] A new method for polymer filling with localization of the monomer on the surface of the filler is described. The method employed initial chemical grating on the polymer filler which swelled in the monomer of the principal polymer. Addition of the monomer containing oil soluble initiator

to an aqueous dispersion of thus-modified filler results in its absorption through the swollen polymer layer grafted on the filler. Thus, prior to the actual polymerization, the monomer is completely and uniformly localized at the surface of the monomer which then polymerizes, with temperature increase, uniformly covering the surface. This concept was shown to be practical on an example of filling polystyrene with chalk. This method makes it possible to prepare a wide range of composites by varying the ratio of starting compounds. Figures 2; references: 2 Russian.

7813/9716
CSO: 1841/82

NIKOLAY PLATE: PHYSICS AND CHEMISTRY OF POLYMERS

Moscow KNIGA I ISKUSSTVO V SSSR in Russian No 3, Jul-Sep 86 pp 16-17

[Article, Chief Editor N. Kolesnikova]

[Abstract] Nikolay Plate, a renowned chemist born in 1934 in Moscow, graduated from Moscow State University where later he headed the Laboratory of Chemical Conversions of Polymers. Since 1985, he has been director of the Institute of Petrochemical Synthesis of the USSR Academy of Sciences. He is a corresponding member of the USSR Academy of Sciences. He has authored more than 350 scientific tasks, among which are several monographs and has 70 inventions. Since his early student days, he has retained an interest in polymer chemistry. He formulated the principles of chemical structure modifications of polymers, a fundamental contribution to high molecular weight chemistry. The monograph, "Macromolecular Reactions" (KHIMIYA), by Nikolay Plate with coauthors Arkadiy Litmanovich and Olga Noa is an absolutely original treatise with no analogous text in world chemical literature. In that text, the authors describe the chemical behavior of compounds from a physical-chemical perspective. Nikolay Plate, with his students and colleague Valeriy Shibayev, described the physics and chemistry of polymers in the book "Rigid-Formed Polymers and Liquid Crystals" (KHIMIYA) in which fundamental investigations of structure and properties of rigid-shaped polymers are given. It is the first formulation of the principles of creating macromolecules with thermotropic liquid-crystalline characteristics. A monograph "Physiological Activity of Polymers" (KHIMIYA) by Nikolay Plate and Aleksander Vasilyev, appeared in 1986; it describes studies and synthesis of medicines and formulations including synthesis of polymeric materials and their chemical structure which are of interest in clinical medicine and biochemistry. The text discussed the strategy and tactics for synthesis of physiologically-active polymers of practically all classes, active transport of synthetic macromolecules in the organism and presents exhaustive information on the synthesis, structure and properties of polymers for heart-vascular, antitumorigenic, antibacterial and immunological activity. A book "Liquid-Crystalline Polymers," under the editorship of Nikolay Plate, will be published in 1988. In it the authors cover all problems associated with the liquid-crystalline state of high molecular compounds, beginning with the theory and ending with the practical application of these polymers in chemical technology.

12886/9716
CSO: 1841/46

CHEMICAL STABILITY OF REINFORCED POLYMERIC COMPOSITES USED IN AMMONIA SYNTHESIS

Moscow KHIMICHESKOYE I NEFTYANOYE MASHINOSTROYENIYE in Russian No 9, Sep 86
pp 32-33

[Article by A.M. Gleykh, engineer, and L.V. Alekperova and A.M. Krivatkin,
candidates of technical sciences]

[Abstract] Trials were conducted with exposure of Komponor PP03-4-0 (filler-reinforced polypropylene) at 120°C to solutions employed in the production of ammonia, to evaluate this composite material for usefulness in sealing rings and possible replacements for costly stainless steel. The experiments involved exposure of Komponor to Karsol solution (25-28% K_2CO_3 , 1.9% diethanolamine, 0.4% V_2O_5) and 20% monoethanolamine at 120-13°C for 600 h. The data showed only minimal deformation (0.4-0.6%) with no decomposition. A similar degree of resistance was exhibited on exposure to glycerol for 100 h at 120°C. These observations indicate that Komponor is suitable for use in various devices in the production of ammonia as a replacement material for many articles currently made from 12Kh18N10T stainless steel.

12172/9716

CSO: 1841/83

WATER TREATMENT

COMPRESSED NATURAL GAS TO FUEL VEHICLES

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 29 Aug 86 p 1

[Article: "At the Politburo of the CPSU Central Committee"]

[Excerpt] The Politburo has approved the test and the proposal for wide spread use of natural and liquefied petroleum gas as motor fuels. It commissioned planning and management bodies to increase production of trucks, specialized vehicles, buses, and municipal service vehicles which use highly compressed natural and liquid petroleum gas, and ordered them to build and operate facilities to fuel such vehicles. Accomplishing these steps will significantly decrease the use of gasoline and diesel fuel.

9016

CSO: 1841/2

WOOD CHEMISTRY

CURRENT STATE OF TIMBER INDUSTRY

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 21 Sep 86 p 2

[Article by M. Busygin, USSR Minister of the Timber, Pulp and Paper, and Wood Processing Industry: "The Beginning of the Turn Around"]

[Text] As usual, we use our professional holiday to estimate what has been done recently and how it was done.

Timber Workers' Day is celebrated by our timber industry by fulfilling the plan. For the first eight months of this year we have exceeded our tasking by 300 million rubles in the production of wood, pulp, and paper, including newsprint and items for the marketplace.

Leading contenders in the competition include the "Karellesprom" Association, headed by I. Sankin, and which has changed over to the new management system; and also the "Irkutsklesprom" Association headed by G. Romanyuk, and the "Tyumenlesprom" Association, headed by T. Minin. These are the same ones who at the end of last year came up with an initiative which was approved by the CPSU Central Committee. Other outstanding work was done by collectives of the SyktyvkarSKIY Lumber Industry Complex [LPK], the MoskovSKIY Furniture Assembly Combine No. 1, the "Gigant" Match Factory, and many others.

But there is one small shortcoming with holidays; they are soon over. That is why today, on Timber Workers' Day, I wanted to not only say a good word about the leading collectives, as I have done, but also share my impression of what joins "yesterday" with "tomorrow", and about our urgent work and anxieties.

There is improvement. But it is only improvement, the beginning of the turn around. If the branch is to constantly meet its obligations to the state, it must work without ladders. What is actually being done today? Following the example of those who initiated the competition, the crews of the "Sakhalinlesprom" and the "Primorlesprom" Associations, headed by V. Kovalev and Eh. GrabovSKIY respectively, have started working much faster and by 15 and 16 percent respectively have increased production of round wood. They have overcome their lags in completing their Socialist obligations. And they did it in the summer, which is not the best lumbering period. Simultaneously, the "Permlesprom", "Sverdlesprom", and "Zabaykallesprom" Associations, headed respectively by S. Kuznetsov, N. Lyashuk, and V. Kokin, were unable to use

their internal reserves and as summer came along their work slowed. Due to such breakdowns, the branch's tasked deliveries were only 97.9 percent of planned.

What is the matter? What makes one organization leap ahead while another takes each step forward creaking, with difficulty?

I recall one of my meetings with Pavel Vasiliyevich Popov, a noted brigade chief of lumberjacks from Tyumen, a man twice named a Hero of Socialist Labor. Our meeting took place on a work site at the Komsomolskoye Lumber Industry Establishment [LPKh] where he works. I was interested in his experience. Why is it that Popov's brigade has achieved such extraordinary success?

I talked with him and I saw, I felt it. Pavel Vasiliyevich is in a hurry with his people. He wants to get to work faster. And this is significant.

Work time is sacred to this Tyumen brigade chief and his comrades. Without it, Popov would not be Popov. There is a strict rule among the brigade -- if you haven't completed your task, you don't leave the felling site.

There was talk about his attitude to his work, and about using work time.

Winter is approaching. This is the best time of the year for lumber workers. But it would be wrong in principle to think only about the sweetness of nature, as we do from time to time. We have to be well prepared for winter, so that we can completely utilize literally each frozen day to obtain a sharp increase in timber cutting and extraction. The crux of such preparation is setting up conditions for multi-shift operation.

This is not a private matter. Recently, "Sotsialisticheskaya Industriya" talked at length about the experience of the Leningraders, who decided to adopt two-shift operation across a broad front. Such restructuring provides more complete use of highly-productive equipment, it allows cutting back on new construction, and to put part of the resources that are freed to work on social needs. That is, in practice this is the changeover to an intensive method of development.

We have analyzed this experience. Certainly, we have our own specifics in our branch. But this approach to business itself is ripening, is actual for us. And we have decided to broadly support the Leningraders' initiative.

The changeover to multi-shift operation was not started here today. And the leading collectives, some of whom I have already named, have already become aware of the advantages of the new method, and have received significant bonuses. But if one takes the branch as a whole, the change-over is taking place very slowly. At the "Permlesprom", "Sverdlesprom", and "Vologdalesprom" Associations, for example, only about one-half of the assigned number of logging machines and chokerless tractors are working two shifts.

We obviously cannot be satisfied with such a situation.

One of the first to adopt multi-shift operation was a collective from the Komsomolsk LPKh, where multi-function equipment is already working in two shifts. We are striving to have as many timber workers as possible be working this way, which experience has shown to be superior. Along with this, the LPKh and association managers have established special mobile groups made up of the most qualified workers. These are being sent to their home organizations so that there, in concrete conditions, they can help the collectives adopt the best work methods.

I cannot avoid saying that this new approach to business, this modern organization of work is characteristic not only of P. Popov, and not only of the Komsomolsk LPKh. On our professional day it is completely proper to name lumbering brigade chiefs such as F. Golubev from the Ust-Ilimskiy LPK, V. Ivanov from Irkutsk, and M. Gusev from Sverdlovskaya Oblast. His brigade is working in three shifts for cross cutting timber. And there are many others. There is something to be learned from them.

But it is important that we learn. The changeover to two- and three-shift operation demands in reenforcement a large number of qualified workers and operations. But how are we going to man, for example, a second shift at "Kostromalesprom", "Kirovlesprom", and several other associations when the task to train lopping machine operators, a task confirmed by the ministry, is only 30-40 percent complete there? It turns out, in the words of the chiefs of these associations, that hope for the two-shift operation and the business is expressed in the habitual "maybe."

The ministry has examined in detail the reasons for further improvement and it has developed steps to provide steady work for the timber workers for the winter.

But training of cadres and changeover to multi-shift operation makes up only one, albeit important, side of the matter. No less real is another. There is a great deal of room for more complete use of equipment and the raw material base without new capital construction. This is brought about by the vakhtovyy method. [Note: this "special work", or "vakhtovyy" method involves transporting workers to a deployed work site from a centralized dispatching location where there are residential and communal services.] At the "Tomlesprom" Association, for example, one-fourth of all lumber production is done under this method.

It would seem that there are not all that many new vakhtovyy settlements appearing on the map of Tomskaya Oblast in recent years. But the life and the work of the people who are settling in them has changed. Whereas before the wood was cut using gasoline powered saws, now about half of this work is mechanized.

The lumberjacks here have someplace to rest, to read newspapers, to watch television or films after work. The lumberjacks are well fed. They do not feel that they are nomads, temporary residents.

Why is it then, that this vakhtovyy method is not more widely used by the neighbors of the Tomskians, those from Krasnodar? The raw material base for

many LPKh's is exhausted here. Yet there is no scarcity of forest in the (Krasnodarskiy) Kray. One needs only take it. Last summer, however, the Krasnodarians organized nine fewer vakht's than were planned.

In trying to obtain a speedup in the branch's development, timber industry enterprises and associations have placed some difficult tasks before themselves. It has been decided that during the first quarter of 1987 they must extract no fewer than 100 million cubic meters of timber, or 47 percent of the year's plan. This is almost 3.5 million cubic meters more than during the corresponding period of last year. One must state directly that with the old approach to work, with the previous methods of work that goal will not be met. There must be complete support for using modern equipment, and the skill to prize every minute of working time -- as distinguished the leading collectives, the best performers of our multi-branch production.

In closing I must mention one important feature of the times. Recently there has been a notable increase in the flow of fresh forces into the ranks of the leaders and innovators of production. Even recently there were few in the branch who knew the names of cross-cutting brigade chief Yu. Vesnin from Arkhangelskaya Oblast, pulp maker V. Alekseyev from the Balakhninskiy or A. Popov from the Solombalskiy Pulp and Paper Combines, or furniture assembly brigade chief S. Petunina from the Gatchinskiy Combine and many others. But today these people are bravely throwing out the call to the famous masters, catching them, and at times overtaking them. This gladdens me and gives me hops. The advance in work which has begun and which is increasing in many collectives guarantees that the great plans and obligations will be fulfilled.

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